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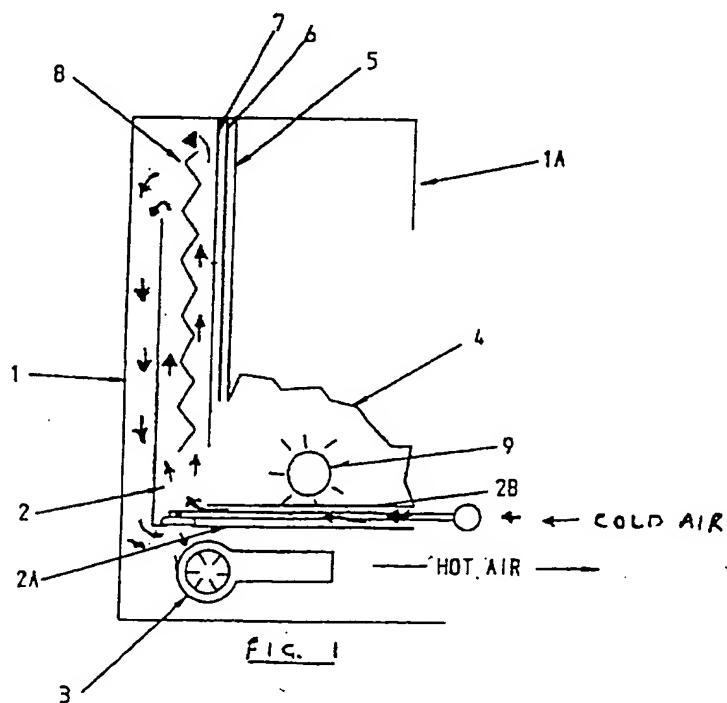
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(54) An electric heating apparatus including means for simulating flames

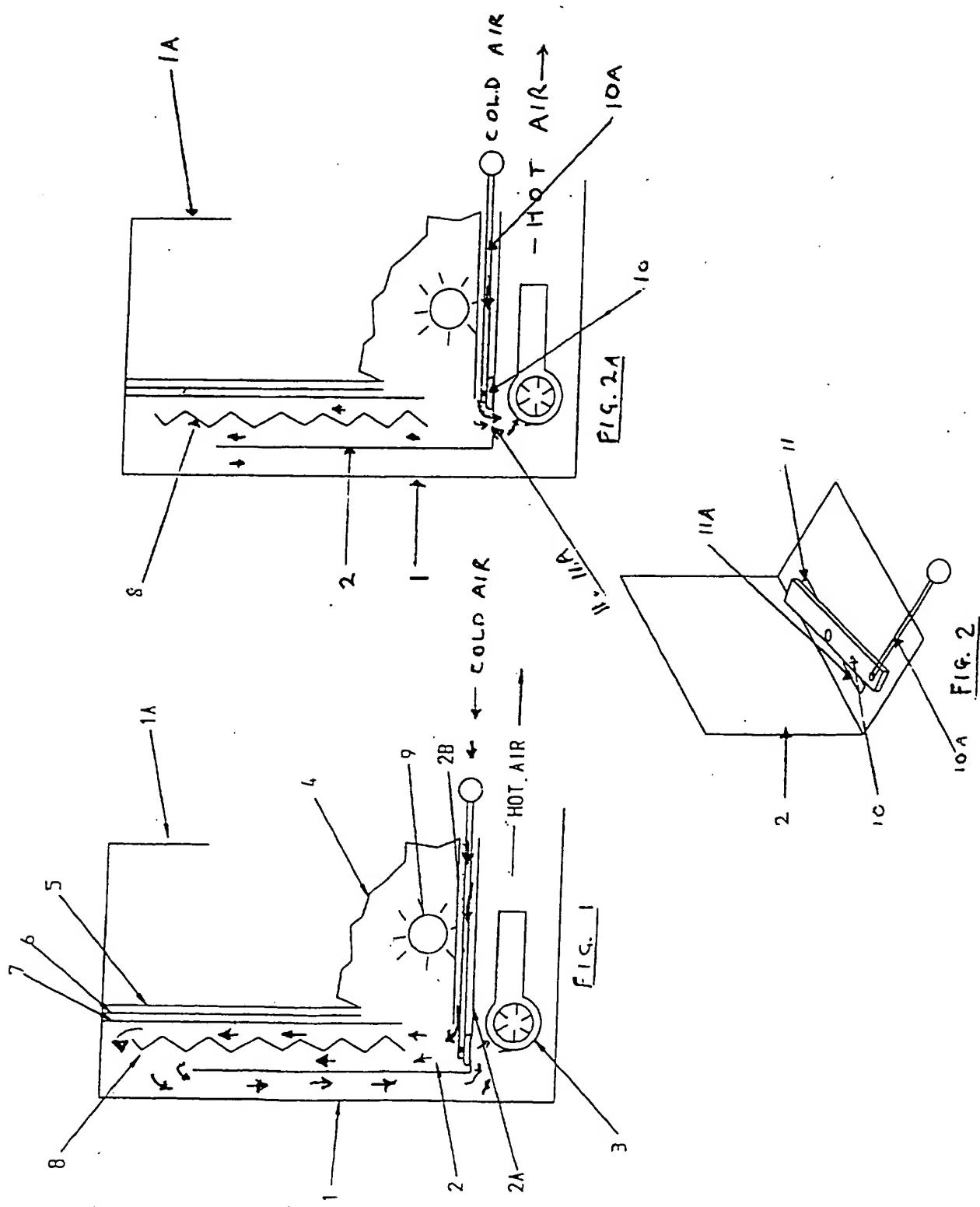
(57) An electrical heating apparatus including means for simulating flames comprises a housing (1) defining an air throughflow passage including an air inlet, a first portion (2) containing simulated flame effect means (8) and leading via another portion (12) to a forced air convection unit (3), and an outlet for heated air. A front side of said first portion is formed by screen means (5, 7) which are capable of diffusely transmitting light reflected by said flame effect means. Simulated fuel means (4) are located on a side of said screen means remote from said simulated flame effect means. A light source (a) illuminates said simulated flame effect means and said simulated fuel means. The simulated flame effect means may comprise a slotted flexible sheet (8) of highly reflective material. A manually-operable, pivotally mounted closure flap acts as a bypass to the portions (2, 12).



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An electric heating apparatus including means
for simulating flames

The present invention relates to an electric heating apparatus including means for simulating flames.

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In GB 1186655 of H. Frost & Company Ltd an electric illumination device is disclosed in which air is continuously recirculated inside a substantially airtight compartment by an impeller driven by an electric motor so as to cause a row of flexible strips of reflective material to flutter and create a flame effect on a translucent front viewing screen and in which imitation solid-fuel means is located in front thereof. It is stated that the device may form part of an electric heater although no disclosure is made of the nature of the heating means.

In GB 2230335 of Bitech Engineering an apparatus similar to that of GB 1186655 is disclosed except that the screen inbetween the simulated fuel means and the ribbon-like simulating flame effect means is capable of diffusely transmitting light reflected by the flame effect means and is also capable of reflecting light from the simulated fuel means so that the simulated flames appear to emanate between the simulated fuel means and an image of the latter means reflected in the screen means. In the Bitech patent the fan unit for moving the ribbon like simulated flame effect members operates within a sealed chamber and a separate forced air convection unit is provided in a space therebelow and separated from the compartment of the ribbon-like flame effect members by a partition.

According to the present invention an electric heating apparatus including means for simulating flames comprises a housing defining an air throughflow passage including an air inlet, a first portion containing simulated flame effect means and leading via another portion to a forced air convection unit or fan and heating means, and an outlet for heated air, a front side of said first portion being formed by screen means which are capable of diffusely transmitting light reflected by said flame effect means; simulated fuel means being located on a side of said screen means remote from said simulated flame effect means; and a light source for illuminating said simulated flame effect means and said simulated fuel means.

Preferably said light source is located beneath the simulated fuel means and lower than said simulated flame effect means to illuminate both of such and preferably is located below and forwardly of said screen means.

The screen means may comprise a translucent sheet capable of diffusely transmitting light reflected by said flame effect means and may have an adjacent supporting and/or colour providing screen of transparent material adjacent thereto which if located forwardly of said translucent screen will preferably have a front non-reflective surface and will preferably be forwardly inclined out of the vertical. It is not intended that screen means be such and/or the relative intensity of illumination therebehind be such that the simulated fuel means is reflected in the screen means or not to any significant extent.

The simulated flame effect means will preferably comprise a sheet of highly reflective, translucent

material, such as satin nylon with slits formed therein and portions sprayed with black markings to enhance or create the flame effect upon movement.

It will be appreciated that the apparatus of the present invention provides for considerable economies in that only a single fan and impeller is required namely that of the forced air convection unit, which also reduces the noise, and that the formation of the simulation flame effect means from a single sheet the plurality of slits therein with being darkened in regions to enhance the flame effect, provides for economies and advantageous effects.

In a preferred embodiment, an aperture is provided in the region of the inlet or in an upstream region of said first portion of the housing and communicates with the inlet of the force air convection unit and a control member such as a slidable flap which is manually operable to open and close said aperture such that the amount of air being drawn over said simulated flame effect means can be reduced or controlled as desired so that said region of the flow passages bypassed or at least a portion of the air which would otherwise flow therethrough is bypassed when the aperture is opened.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a schematic vertical section through an apparatus of one embodiment of the invention with a short-circuit aperture closed;

Fig. 2 is a schematic enlarged fragmentary detail

illustrating a short-circuit aperture and closure flap therefor; and

Fig. 2A is a view similar to Fig. 1 but with the aperture opened;

In Fig. 1 part of an electric heating apparatus is schematically illustrated and comprises a housing 1 with a canopy 1A for aesthetic appearance and an inner direction plate 2C defining an airflow passage and lower and upper ducting plates 2A, 2B defining an inlet. A first, upwardly extending airflow portion 2 is defined in which there is located a simulated flame effect means in the form of a slit sheet 8 suspended at the top and held in position at the bottom by means (not shown), and another flow portion 12 at the rear of said first portion 2 and extending downwardly so as to direct airflow after it has passed over said simulated flame effect means 8 to the suction inlet of a forced air convection unit 3 generally comprising an electric heating element and a fan for passing an airstream over the element, and an outlet protected by a grill (not shown). The simulated flame effect means comprises generally a rectangular flexible sheet 9 of highly reflective material such as satin nylon material of yellow, gold or light red, having a plurality of upwardly extending slits formed therein to allow to pass therethrough and with portions of the material blackened to enhance the flame effect and with said material being supported so that air passing thereover will cause such to flutter and create the desired flame effect.

The flame effect is viewable through screen means comprising a non-reflecting screen 5 in clear or tinted colour material and diffusing screen 7 of translucent material. The front protective sheet or screen 5/6 may

be inclined slightly out of the vertical and forwardly;

In front of the front screen 5/6, a simulated fuel means such as simulated coal or log effect is indicated by reference numeral 4 and beneath which a light source in the form of an electric lamp 9 is located which illuminates both the simulated fuel means 4 and the simulated flame effect means 8. As mentioned before, the diffuser 7 may be located forwardly of the coloured screen 5/6 or might take its place and in any event it is not desired that the front surface of the screen means be in any way reflective or at least that such distract from the actual simulated fuel means.

In the region of the end of the inlet passage defined between plates 2A, 2B, an aperture 11, 11A is provided in the lower wall and leads to the fan unit 3 and has a pivotally mounted closure flap 10 which is manually adjustably displaceable via knob 13 and control rod 14 pivotally connected at one end of flap 10 to open and close the aperture 11, 11A to a degree as desired and enable the first portion 2 and other portion 12 of the flow passage to be by-passed or partially by-passed when it is desired to reduce the flow over the simulated flame effect means 18 and to change the appearance of the simulated flame effect means and the apparent rate of combustion.

CLAIMS

1. An electrical heating apparatus including means for simulating flames comprising a housing defining an air throughflow passage including an air inlet, a first portion containing simulated flame effect means and leading via another portion to a forced air convection unit or fan and heating means, and an outlet for heated air, a front side of said first portion being formed by screen means which are capable of diffusely transmitting light reflected by said flame effect means; simulated fuel means being located on a side of said screen means remote from said simulated flame effect means; and a light source for illuminating said simulated flame effect means and said simulated fuel means.
2. Apparatus as claimed in claim 1, in which said light source is located beneath the simulated fuel means and lower than said simulated flame effect means to illuminate both of such.
3. Apparatus as claimed in claim 2, in which said light source is located below and forwardly of said screen means.
4. Apparatus as claimed in any of claims 1 to 3, in which the screen means comprises a translucent sheet capable of diffusely transmitting light reflected by said flame effect means.
5. Apparatus as claimed in claim 4, in which said sheet has an adjacent supporting and/or colour providing additional screen of transparent material adjacent thereto.

6. Apparatus as claimed in claim 5, in which said additional screen is located forwardly of said translucent screen and has a front non-reflective surface.

7. Apparatus as claimed in claim 6, in which said additional screen is forwardly inclined out of the vertical.

8. Apparatus as claimed in any of claims 1 to 7, in which the screen means are not such and/or the relative intensity of illumination therebehind are not such that the simulated fuel means is reflected in the screen means or not to any significant extent.

9. Apparatus as claimed in any of claims 1 to 8, in which the simulated flame effect means comprises a sheet of highly reflective, translucent material, such as satin nylon with slits formed therein and portions with black markings to enhance or create the flame effect upon movement.

10. Apparatus as claimed in any of claims 1 to 9, in which only a single fan and impeller is provided.

11. Apparatus as claimed in any of claims 1 to 10, in which the simulation flame effect means is formed from a single sheet having a plurality of slits therein and being darkened in regions to enhance the flame effect.

12. Apparatus as claimed in any of claims 1 to 11, in which an aperture is provided in the region of the inlet or in an upstream region of said first portion of the housing and communicates with the inlet of the forced air convection unit/fan and a control member, such as a slidabile flap which is manually operable, to open and close said aperture such that the amount of air being

drawing over said simulated flame effect means can be reduced or controlled as desired so that said region of the flow passages bypassed or at least a portion of the air which would otherwise flow therethrough is bypassed when the aperture is opened.

13. An apparatus including means for simulating flame substantially as herein described.



Patent Office

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Application No: GB 9513154.6
Claims searched: All

Examiner: Mick Monk
Date of search: 2 October 1996

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): F4W W57

Int Cl (Ed.6): F24C (7/00; 15/06)

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 1088577 (THERMAIR DOMESTIC APPLIANCES) Consider whole document; see eg Fig.2.	1-8 at least

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.